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RN-6827

B. E. III (Sem. V) (IC) Examination

May / June – 2010

Linear Integrated Ckts.

Time : **3** Hours] [Total Marks : **70**

Instruction :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ **B. E. 3 (Sem. 5) (IC)**

Name of the Subject :

☛ **Linear Integrated Ckts.**

☛ Subject Code No. : **6 8 2 7** ☛ Section No. (1, 2,.....) : **1&2**

Seat No. :

Student's Signature

SECTION - I

1	(a)	Answer the following in brief :	**10**
		(i) What is an instrumentation amplifier?	**1**
		(ii) What does the term balanced output mean?	**1**
		(iii) Define the following electrical parameters : (a) Input offset voltage (b) Output voltage swing.	**2**
		(iv) List the four negative feedback configurations. Which two configurations are most commonly used?	**2**
		(v) What is thermal drift? How does it affect the performance of an Op-Amp?	**2**
		(vi) What is an electrical noise?	**1**
		(vii) Briefly explain the need of compensating networks in Op-Amps.	**1**
	(b)	Explain the working of a 3-Op-Amp instrumentation amplifier with the help of a neat diagram.	**8**
2	(a)	Explain the operation of an Op-Amp as (i) adder (ii) subtractor.	**8**
	(b)	Draw the ckt diagram of a non-inverting schmitt trigger and explain its operation with the help of hysteresis curve.	**8**

OR

2 (a) Explain Op-Amp as an integrator in detail. 8

(b) Explain the working of a sample and hold ckt. using Op-Amp. and also an inverting amplifier. 8

3 Attempt any **two** : 8×2=16

(i) Draw the block diagram of an Op-Amp. List the characteristics of an Op-Amp. Give typical values of the same for IC 741.

(ii) What is a slew rate? List causes of slew rate and explain its significance in applications.

(iii) What are the factors that affect the input offset voltage, input bias and input offset currents?

4 (a) Give answers in brief : 10

(i) What is the difference between summing and averaging ckt? 2

(ii) What is the function of level translator stage in Op-Amp. 2

(iii) Write the characteristics of an ideal Op-Amp. 2

(iv) Give two advantages of instrumentation amplifier. 2

(v) What is a differential amplifier? Which are its different configurations? 2

(b) Explain the working of an astable multivibrator using IC 555 with diagram and suitable expresion. 8

5 (a) Explain second order high pass butterworth filter using Op-Amp. 8

(b) Explain digital to analog converter using R-2R ladder networks. 8

OR

5 (a) Define filter. Derive an expression for gain for a second order low pass filter. 8

(b) Explain the working of successive approximation type analog to digital converter. 8

6 Attempt any **two** : 8×2=16

(i) Explain with the help of a neat block diagram a voltage regulator using IC 7805. What is meant by 'Temperature Stability' and 'ripple rejection'?

(ii) Explain wein-bridge oscfillator using Op-Amp. Design wein-bridge oscillator so that output frequency fo = 1 kHz.

(iii) Explain the working of full wave precision rectifier and discuss its advantages over conventional rectifier.
